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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/998,241	12/03/2001	Philip Joseph Koh	A8250	6210
7590	05/04/2004		EXAMINER	
SUGHRUE, MION, ZINN, MACPEAK & SEAS, PLLC 2100 Pennsylvania Avenue, N.W. Washington, DC 20037-3213			MAGEE, THOMAS J	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 05/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/998,241

Applicant(s)

KOH, PHILIP JOSEPH

Examiner

Thomas J. Magee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 23-33 is/are allowed.
- 6) ☒ Claim(s) 34-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections – 35 U.S.C. 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 34 – 37, 44 and 45 are rejected under 35 U.S.C. 102(b) as being anticipated by Rai et al. (US 4,818,728)

3. Regarding Claim 34, Rai et al. disclose a method of making a dielectric package having an integral connection component (Col. 3, line 63 through Col. 4, line 45) comprising a first die having an integral planar connection patterned on the first die (Figure 1(A, 2)) and a second die having a conductor patterned on the second die (Figure 1(B), 2'), wherein the two die are bonded to each other (Figure 1(C) and Figure 4), each having an interconnect surface that intersects in the bonding process, thereby forming a coplanar connection between the two.

4. Regarding Claim 35, Rai et al. disclose a method for housing a component having an integral connection component wherein the connection component has a "male" shape (See Figure 1(A)).

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5. Regarding Claim 36, Rai et al. disclose a method for housing a component having an integral connection component wherein the connection component has a "female" shape (See Figure 1(B).

6. Regarding Claim 37, Rai et al. disclose a method for making a dielectric package for housing a component and having an integral connection component, that the first and second die are placed over each other (Col. 5, lines 16 – 21) and attached (coupled), as shown in Figure 4, prior to bonding of the two units.

7. Regarding Claims 44 and 45, Rai et al. disclose a method for making a package for housing a component and having an integral connection member, wherein there are a plurality of components of both male and female types (Figures 1(A) and 1(B)).

Claim Rejections – 35 U.S.C. 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 38 – 40, 42, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rai et al., as applied to Claims 34 – 37, 44, and 45, and further in view of Tukamoto et al. (US 5,376,825).

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10. Regarding Claims 38 – 40, Rai et al. do not disclose the formation of an aperture in the housing assembly or the mounting of a component after bonding. Tukamoto et al. disclose (Figure 8) the formation of an aperture with cover plate (29) atop and mounting of a component (IC) (200) in the cavity subsequent to bonding. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the aperture of Tukamoto et al. in Rai et al. to obtain a useful mounting package.

11. Regarding Claims 42 and 43, Rai et al. and Tukamoto et al. do not disclose that the component is an optical fiber or optical semiconductor. However, Tukamoto et al. disclose the use of an aperture and versatile mounting of components in the cavity of the package. The mounting of optical fibers and semiconductors in packages or housing structures is extremely well known in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the apertured cavity of Tukamoto et al. to mount optical fibers or semiconductors and to combine with Rai et al. and to obtain a workable package.

11. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rai et al. in view of Tukamoto et al., as applied to Claims 34 – 40, and 42 - 45, and further in view of Kazior et al. ("DBIT – Direct Backside Interconnect Technology: A Manufacturable, Bond Wire Free Interconnect Technology for Microwave and Millimeter Wave MMICs," Microwave Symp. Digest, (1997), Vol. 2, pp.723 – 726).

Neither Rai et al. nor Tukamoto et al. disclose that the integrated circuit is a millimeter/microwave integrated circuit. However, Kazior et al. disclose (Figure 1) the mounting of an

MMIC chip in a housing where patterned conductor areas on the first die “mate” with strips on the second die (p.724, left side, top), forming a coplanar contact surface with through-vias and metal filling the vias. It would have then been obvious to one of ordinary skill in the art at the time of the invention to combine Kazior et al. with Rai et al. and Tukamoto et al. to obtain a low loss housing structure for MMIC devices.

Allowance

12. Claims 23 –33 are allowed. A review of the prior art shows that in the claims of the instant application, the method of making an interconnectable package using wafers with a plurality of “carrier” die having a patterned transmission line and etched aperture for mounting of components with etched planar interconnect features, where the die are bonded along planar surfaces to form pockets, is not taught or suggested in the art.

Response to Arguments

13. Applicant’s arguments with respect to claim rejections have been carefully considered by Examiner but these have been found to be unpersuasive. In particular, with regard to Applicant’s commentary (pp. 8 – 9, Response) on the failure to disclose under 35 U.S.C. 102(b) the recitations of currently amended claim 34, Examiner does not agree with the allegations. The claim recites that the conductors on each die are aligned and bonded in a coplanar state and the reference clearly reads on this limitation.

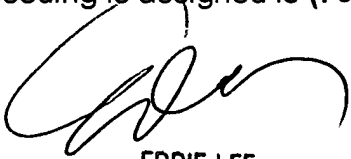
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The combination of Rai et al. and Tukamoto et al. (p. 10, Response) is indeed acceptable and provides a means for obtaining a workable package for mounting fiber optics or semiconductors. The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

In like fashion, Examiner does not agree with suggestions of Applicant that Kazior et al. is not combinable with Rai et al., since direct backside interconnect technology is integratable in Rai et al.

Conclusions

14. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to **Thomas Magee**, whose telephone number is **(571) 272 1658**. The Examiner can normally be reached on Monday through Friday from 8:30AM to 5:00PM (EST). If attempts to reach the Examiner by telephone are unsuccessful, the examiner's supervisor, **Eddie Lee**, can be reached on **(571) 272-1732**. The fax number for the organization where this application or proceeding is assigned is **(703) 872-9306**.



EDDIE LEE
SUPERVISORY PATENT EXAMINER
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Thomas Magee
July 6, 2003